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ABSTRACT

Problems and issues in U.S. undergraduate education are identified, and 10 recommendations for improvement are offered. Specific reference is made to agriculture faculty. Problems and issues include: current emphasis on academic specialization rather than the development of integrated, holistic students; the purpose of a liberal education versus the specialized needs of corporate employers; and the relationship of science and religion. Suggestions include: faculty members should be simultaneously generalists and specialists; writing should be a natural pursuit of a scholarly person; faculty development activities should support breadth in the professor and the curriculum; policymakers need to reaffirm and support teaching as the foremost function of a university; state colleges should concentrate on general education and/or a few strong disciplines and try not to compete with the comprehensiveness or research orientation of large flagship institutions; undergraduate programs, with emphasis on liberal arts and critical thinking, should be distinct from graduate programs, with their emphasis on advancement of technical skills. (SW)

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THE TEACHER/SCIENTIST: FROM TRAINER TO EDUCATOR

Michael J. Ellerbrock*

INTRODUCTION

In addition to the recent serious calls[1-7] for improved undergraduate education across all disciplines, several critiques[8,9] focussed on agriculture faculty in particular. Fundamental issues in both cases include: 1) the meaning of an "educated" person, 2) the appropriate model of the ideal university, 3) the training, development, values, role and evaluation of faculty members, and 4) the prospects and process for academic reform. This paper attempts to identify some of the current critical problems, address some of the key issues involved and propose a set of necessary, but probably insufficient, solutions.

PROBLEMS

Much of the literature on contemporary American education argues that universities are not producing well-rounded graduates, i.e. that schools are not educating the whole person in order to develop integrated, holistic citizens capable of effective personal and professional problem solving and leadership. According to Stephen Bailey, former vice president of the American Council on Education, "This nation is in woefully short supply of people equipped to look at problems as a whole, at life as a whole. Without a sense of the whole, we have no way of evaluating the part. . . ."[10] Pirsig asserted that professors themselves are part of the problem:

> It's a problem of our time. The range of human knowledge today is so great that we're all specialists and the distance between specializations has become so great that anyone who seeks to wander freely among them almost has to forego closeness with the people around him. The lunchtime here-and-now stuff is a specialty too.[11]

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The problem is not a recent development. In 1880, Dostoyevsky expressed his perspective on modern scholars: "But they have only analyzed the parts and overlooked the whole, and, indeed, their blindness is marvelous."[12] Today's emphasis on academic specialization has hindered development of the integrated person (student and faculty) and left many institutions struggling without a unified sense of purpose.[13-16] Tyler argues:

> The university has gone multi. And the 'community of scholars' has become a disunity of disciplines; it increasingly resembles Ardrey's noyau: 'groups of individuals held together by mutual animosity, who could not survive had they no friends to hate.'[17]

Furthermore, the solution to narrowness of intellectual vision and the limitations of specialization in technical fields is not for faculty to abandon research pursuits and work for schools with instructional missions only. Here, Pirsig believes:

> At a teaching college you teach and you teach and you teach with no time for research, no time for contemplation, no time for participation in outside affairs. Just teach and teach and teach until your mind grows dull and your creativity vanishes and you become an automaton saying the same dull things over and over to endless waves of innocent students who cannot understand why you are so dull, lose respect and fan this disrespect out into the community. The reason you teach and you teach and you teach is that this is a very clever way of running a college on the cheap while giving a false appearance of genuine education.[11]

Within agriculture, Conner calls for faculty to become more diversified in "knowledge and skills."[18] However, Conner's assessment ignores two key questions: 1) will increased knowledge bring increased wisdom and vision, and 2) will academic departments become more diversified by hiring more integrated individuals or by hiring a wider variety of technicians? Rassmussen and Hildreth feel the Land Grant University System has underinvested in agricultural research and call for more emphasis on "innovative" basic, versus applied, research,[19] yet their analysis avoids an important question: will faculty members be given the time to focus on quality and be creative on a few

projects at a time, or will they continue to be pressured into producing an excessive quantity of manuscripts per year, an administrative expectation which partially explains professors' tendency to stress applied studies with quick turnaround time?

Another problem is that the curricular emphasis on specialization implies to the student that education is primarily a means to an end, i.e. a career, rather than an end in itself, i.e. to be an integrated, fulfilled person. Several authors have criticized this development[20,21] and several others have passionately espoused the latter viewpoint and discussed the definition of an "educated" person.[22-28] For example, Murchland argues that all students, particularly those in the sciences, must be taught that the technology they develop is not value-neutral.[29] Education should thus provide appreciation of the interrelationships of disciplines, e.g. engineering and ethics.

MULTIDISCIPLINARY ISSUES

Two examples of significant issues for students and faculty to address are: 1) the purpose of a liberal education versus the specialized needs of corporate employers, and 2) the relationship of science and religion. A substantial body of literature asserts that training in the humanities is of definite benefit to business managers,[30-38] though the argument is not without its skeptics.[39] Regardless of the degree of relationship between the liberal arts and industrial careers, the worst case scenario is for a student to infer from a university's disciplinary design and curricula that one must essentially choose between being an intellectual and having a lucrative career, yet many students feel confronted by such a dichotomy. Could this be partly attributable to the student's perception that his/her professor faced the same choice, and apparently decided to be either well-rounded (arts) or a specialist (sciences), but not both?

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Concerning science and religion, are students aware that they might not be mutually exclusive? In the "Mysticism of Science," the noted paleontologist/theologian Teilhard de Chardin identified two basic commonalities between science and religion: "Rightly or wrongly, modern man has put his interest in an unbounded destiny beyond himself. And we have now all embarked to explore and conquer that future. Hope in a limitless future: the two essential characteristics of a religion."[40] With regard to the danger of exclusive reliance on rational thought, Gibran argued that passion should motivate reason and that reason should temper passion.[41] Einstein opined that: "Science without religion is lame, religion without science is blind."[42] Palmer tried to reconcile Christian values with life as a scholarly faculty member who felt a ". . . contradiction between acceptance in respectable circles and the feeling of alienation and separation. . . ."[43]

Improving the quality of undergraduate education in the U.S. requires addressing the problems and issues presented here, plus others. An insufficient, but challenging, strategy is offered in conclusion.

SOLUTIONS

The alleged crisis in American academia forces a reexamination of faculty members' values and aspirations and of the goals and objectives of educational policy makers. Ten suggestions follow:

1. Faculty members should be simultaneously generalists and specialists.

Cleveland feels it is both possible and imperative:

> Breadth is not a contradition of depth, but its complement. No one person can know enough to put a man on the moon, in the sense that grandpa could know just about everything about managing his corner grocery store. So different kinds of people, with differing knowledge and skills and networks of friends and acquaintances, have to come together in organizations designed to transmute their separate expertnesses and their collective insights into wise decisions about real-world problems--which are all interdisciplinary, interdepartmental, interprofessional and (increasingly) international. And the

> priceless ingredient is this: Each of the participants in this complex choreography has to have some understanding of the whole scene in order to play a relevant bit part in the big complexity.[44]

2. Writing should be a natural pursuit of a scholarly person, for in the words of Francis Bacon: "Reading maketh a man full, conference a ready man, and writing an exact man."[45]

3. As Haynes proposes, faculty development activities should support breadth in the professor and the curriculum (e.g. the Humanities and Agriculture Program at the University of Florida):

> A professional development program designed to counteract the narrow specialization encouraged by professional training and career advancement must precede or accompany multidisciplinary curriculum, if the latter is to succeed.[46]

A good example of the need for broadened faculty development programs is the recent call for agriculture faculty to be trained in counseling in order to effectively advise farmers under stress from the current farm crisis.[47]

4. Policy makers must have the courage to reaffirm and support teaching as the foremost function of a university. Until then, Holmes holds policy makers responsible for the current problems.[48]

5. State colleges should find their niche in general education and/or a few strong disciplines, and not try to compete with the comprehensiveness or research orientation of large flagship institutions.[49,50]

6. Undergraduate programs, with emphasis on liberal and critical thinking, should be separate and distinct from graduate programs, with their emphasis on advancement of technical skills.[51]

7. Boulding argues that curricula should minimize technical skills and facts (training) and maximize integration (education) in promoting wisdom:

> We must reexamine the whole process of formal education from the point of view of what is the <u>minimum</u> knowledge, not the maximum, which must be transmitted if the whole structure is not to fall apart. Any economizing of learning, therefore, is highly desirable.[16]

8. University professors should lead by example in working together on complex, real-world problems, Botstein pleads:

> Who, if not the university, shall train the integrators? And what better way is there for the university to pull itself together than to try to pull the world together?
>
> Let there be a core course on Survival of the Species (SOS for short). Its object would be, first, to make each of us aware of our common peril. (If we can't get together out of love, perhaps we can huddle in fear.) Second, it would recommence the education of the whole man: the need for every learned man to know something about more and more, rather than more and more about something. Third, it could teach humility--the many knowns that are unknown; the many specific cures that cause unspecified ills; the difference between man, created in God's image, and God. Fourth, it could inspire regard for the "other"--the other discipline, the other tribe, the other self, the other world of the inarticulate and inanimate.[52]

9. Professors must be people of conviction,[53] even if it means losing merit pay for emphasizing quality rather than quantity in one's research contributions. A universal conviction must be to develop an intellectual philosophy. In 1922, Meiklejohn proferred:

> The essential fact is that we, the college teachers, have no philosophy. We have been trained within the elective system. We are the devotees of "subjects." We live and think amid the fragments of an intellectual world which has been broken down. Ours is the task of building up again another view of life to hold the meanings which we had and have. And if we shirk that task in study and in teaching, no unifying courses will repair the damage. If teachers think in fragments, they cannot teach in wholes.[54]

10. Lastly, professors must be spiritual people, in a nonsectarian sense.[55] Educators must realize that their every encounter with the student, particularly outside the classroom, communicates, at least subtly, whether the professor loves and supports the person as a developing human being, or regards the student as a client to be persevered. The spiritual professor uses knowledge to build people, rather than vice versa, and the student inevitably recognizes the difference.

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